

What Is Claimed Is:

1. A data-driving apparatus of an electro-luminescence display panel, comprising:
  - a display panel receiving a current signal to display an image; and
  - a data driver having a plurality of current sink data drive parts in order to supply data to the display panel based on a constant current,
    - wherein the current sink data drive part comprises:
      - a current sink data drive integrated circuit for supplying the data to the display panel based on the constant current, and a reference current supply/path part for supplying the constant current to the current sink data drive integrated circuit and, at a same time, supplying the same constant current to an adjacent current sink data driver in a cascade circuit configuration.
2. The data-driving apparatus according to claim 1, wherein the current sink data drive integrated circuit comprises:
  - a constant current switching device connected between a voltage source and a ground voltage source; and
  - a plurality of constant current supply switching devices, each connected to the ground voltage source to form a current mirror circuit with the constant current switching device for supplying the constant current to data lines of the panel by

way of selecting switch devices corresponding to the constant current controlled at a 2<sup>n</sup> level through the constant current switching device.

3. The data-driving apparatus according to claim 2, wherein the current sink data drive integrated circuit further comprises:

a plurality of switches connected between the constant current supply switching devices and the data lines for controlling a supply time of the constant current supplied to the data lines to control a pulse width of a current signal.

4. The data-driving apparatus according to claim 2, wherein the constant current switching device and the constant current supply switching device comprise n-type MOSFETs.

5. The data-driving apparatus according to claim 3, wherein the reference current supply/path part comprises:

a first switching device connected between a second voltage source and the ground voltage source;

a second switching device connected to the ground voltage source to form a current mirror circuit with the first switching device;

a third switching device connected to the ground voltage source to form a current mirror circuit with the first switching device and, in addition, connected to a drain terminal of the constant current switching device of the current sink data drive integrated circuit;

a fourth switching device connected between the second switching device and a third voltage source; and

a fifth switching device connected to the third voltage source to form a current mirror circuit with the fourth switching device for transmitting the constant current to the adjacent current sink data driver.

6. The data-driving apparatus according to claim 5, wherein the first to third switching devices comprise n-type MOSFETs.

7. The data-driving apparatus according to claim 5, wherein the fourth and fifth switching devices comprise p-type MOSFETs.

8. The data-driving apparatus according to claim 5, wherein the third switching device is integrated with the current sink data drive integrated circuit.

9. The data-driving apparatus according to claim 3, wherein the reference current supply/path part comprises:

- a first switching device connected between a second voltage source and the ground voltage source;

- a second switching device connected to the second voltage source to form a current mirror circuit with the first switching device;

- a third switching device connected between the second switching device and the ground voltage source to respond to a current control signal passing through the second switching device;

- a fourth switching device connected to the ground voltage source to form a current mirror circuit with the third switching device for supplying the constant current to the adjacent current sink data driver; and

- a fifth switching device connected to the ground voltage source to form a current mirror circuit with the third switching device and, at the same time, connected to a drain terminal of the constant current switching device of the current sink data drive integrated circuit.

10. The data-driving apparatus according to claim 9, wherein the first and second switching devices comprise p-type MOSFETs.

11. The data-driving apparatus according to claim 5, wherein the third to fifth switching devices comprise n-type MOSFETs.

12. The data-driving apparatus according to claim 5, wherein the fifth switching device is integrated with the current sink data drive integrated circuit.

13. The data-driving apparatus according to claim 1, wherein the display panel includes a pixel formed at each intersection part of scan lines and data lines, and the pixel has an electro-luminescence cell and a cell driver, wherein the cell driver comprises:

- a sixth switching device formed between a cell drive voltage source VDD and the electro-luminescence cell for driving the electro-luminescence cell;

- a seventh switching device connected to the cell drive voltage source to form a current mirror with the sixth switching device;

- an eighth switching device connected to the seventh switching device, the scan line and the data line to respond to a signal of the data line;

- a ninth switching device connected gate terminals of the sixth and seventh switching devices, the data line and the eighth switching device; and

- a capacitor Cst connected between the cell drive voltage source VDD and the gate terminals of the sixth and seventh switching devices.

14. A data-driving apparatus of an electro luminescence display panel, comprising:

- a display panel receiving a current signal to display an image; and

- a data driver having a plurality of current source data drive parts to supply data to the display panel based on a constant current,

- wherein the current source data drive part comprises:

- a current source data drive integrated circuit for supplying the data to the display panel based on the constant current; and

- a reference current supply/path part for supplying the constant current to the current source data drive integrated circuit and, at the same time, supplying the same constant current to an adjacent current source data driver in a cascade circuit configuration.

15. The data-driving apparatus according to claim 14, wherein the current source data drive integrated circuit comprises:

- a constant current switching device connected between a voltage source and a ground voltage source; and

- a plurality of constant current supply switching devices, each connected to the voltage source to form a current mirror circuit with the constant current

switching device for supplying the constant current to data lines of the panel by selecting switch devices corresponding to the constant current controlled in a  $2^n$  level through the constant current switching device.

16. The data-driving apparatus according to claim 15, wherein the current source data drive integrated circuit further comprises a plurality of switches connected between the constant current supply switching devices and the data lines for controlling a supply time of the constant current supplied to the data lines to control a pulse width of a current signal.

17. The data-driving apparatus according to claim 15, wherein the constant current switching device and the constant current supply switching device comprise n-type MOSFETs.

18. The data-driving apparatus according to claim 15, wherein the reference current supply/path part comprises:

- a first switching device connected between a second voltage source and the ground voltage source;

- a second switching device connected to the ground voltage source to form a current mirror circuit with the first switching device;

a third switching device connected to the ground voltage source to form a current mirror circuit with the first switching device and, in addition, connected to a drain terminal of the constant current switching device of the current source data drive integrated circuit;

a fourth switching device connected between the second switching device and a third voltage source; and

a fifth switching device connected to the third voltage source to form a current mirror circuit with the fourth switching device for transmitting the constant current to the adjacent current source data driver.

19. The data-driving apparatus according to claim 18, wherein the first to third switching devices comprise n-type MOSFETs.

20. The data-driving apparatus according to claim 18, wherein the fourth and fifth switching devices comprise p-type MOSFETs.

21. The data-driving apparatus according to claim 18, wherein the third switching device is integrated with the current source data drive integrated circuit.



22. The data-driving apparatus according to claim 16, wherein the reference current supply/path part comprises:

- a first switching device connected between a second voltage source and the ground voltage source;

- a second switching device connected to the second voltage source to form a current mirror circuit with the first switching device;

- a third switching device connected between the second switching device and the ground voltage source to respond to a current control signal passing through the second switching device;

- a fourth switching device connected to the ground voltage source to form a current mirror circuit with the third switching device for supplying the constant current to the adjacent current source data driver; and

- a fifth switching device connected to the ground voltage source to form a current mirror circuit with the third switching device and, at the same time, connected to a drain terminal of the constant current switching device of the current source data drive integrated circuit.

23. The data-driving apparatus according to claim 22, wherein the first and second switching devices comprise p-type MOSFETs.

24. The data-driving apparatus according to claim 22, wherein the third to fifth switching devices comprise n-type MOSFETs.

25. The data-driving apparatus according to claim 22, wherein the fifth switching device is integrated with the current sink data drive integrated circuit.

26. The data-driving apparatus according to claim 14, wherein the display panel includes a pixel formed at each intersection part of scan lines and data lines, and the pixel has an electro-luminescence cell and a cell driver,

wherein the cell driver comprises:

a sixth switching device formed between a ground voltage source GND and the electro-luminescence cell for driving the electro-luminescence cell;

a seventh switching device connected to the ground voltage source GND to form a current mirror with the sixth switching device;

an eighth switching device connected to the seventh switching device, the scan line and the data line to respond to a signal of the data line;

a ninth switching device connected gate terminals of the sixth and seventh switching devices, the data line and the eighth switching device; and

a capacitor Cst connected between the ground voltage source GND and the gate terminals of the sixth and seventh switching devices.

27. A data-driving method of an electro-luminescence display panel having a pixel formed at each intersection part of scan lines and data lines, a scan driver to control the scan lines and a data driver to control the data lines, comprising steps of:

simultaneously supplying a constant current generated by an external voltage source to a current sink data integrated circuit and an adjacent current sink data integrated circuit, which are connected in a cascade circuit configuration within the data driver; and

supplying data to the data lines based on the supplied constant current.

28. A data-driving method of an electro-luminescence display panel having a pixel formed at each intersection part of scan lines and data lines, a scan driver to control the scan lines and a data driver to control the data lines, comprising steps of:

simultaneously supplying a constant current generated by an external voltage source to a current source data integrated circuit and an adjacent current source data integrated circuit, which are connected in a cascade circuit configuration within the data driver; and

supplying data to the data lines based on the applied constant current.